

Psychological Monographs: General and Applied

The Performance of Schizophrenic and Normal Individuals Following Frustration*

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I. PROBLEM AND METHOD

Frustrating situations have been stressed by many authorities as a major area in which the reactions of schizophrenic and other psychotic persons differ from the normal. The theories relating frustration and schizophrenia, however, appear to be based mainly upon clinical impressions, since the studies reported in the literature offer little evidence to support or detract from the various hypotheses. (For a bibliography, see reference 15.)

The present study was initiated to provide more nearly adequate experimental evidence regarding the difference between the frustration tolerance of schizophrenic and normal individuals. The major hypothesis in the present study is that the schizophrenic group will manifest a lower frustration tolerance (i.e., a greater quantitative reduction in their level of performance) than the normal group following failure to attain success within the specified tasks. A second hypothesis is that the responses of the schizophrenics will differ qualitatively from those of the normals during and following frustration—for example, they will give a greater number of bizarre responses and will be more apt to abandon the task than the normals. A third hypothesis is that as the number of tasks in which failure is encountered increases, the cumulative effect of these successive frustrations

will result in a progressively greater reduction in performance, and this cumulative effect will be greater in the schizophrenic group than in the normal group.

For the purposes of the present experiment, frustration was said to exist when (a) the individual had demonstrated a need to attain success in a task, and (b) success in certain subsequent items of the

* An abridgement of a dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Psychology, Graduate School of Arts and Science, New York University.

The author wishes to express his sincere appreciation to Professor Leland W. Crafts for his guidance throughout the course of this study.

He is also grateful to Dr. Earl E. Swartzlander, former Chief Clinical Psychologist, and to Dr. Louis Verdell, Manager, both of the Northport Veterans Administration Hospital for their permission and encouragement to carry through this experiment, and to Dr. Robert S. Morrow, Chief Clinical Psychologist of the Bronx Veterans Administration Hospital, for his assistance in completing the study.

For their helpful criticisms and their discussion of the many problems encountered during the course of the research, acknowledgement is due to the many colleagues of the author in the Veterans Administration.

For her patience and encouragement, the author wishes to express his deep gratitude to his wife.

The study was reviewed in the Veterans Administration and is being published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

task was thwarted by virtue of the difficulty of the objective situation. The subjects were merely informed of failures when they occurred. In order to infer the existence of at least a minimal need for success (making the correct response) the subject had to perform adequately on three items in the initial form of each task (i.e., obtain a minimal prefrustration score equivalent to three correct responses).

A. MATERIALS

Four tasks, each consisting of two equivalent forms, were employed. Items within each task were graded for difficulty so that most individuals were likely to experience success initially and encounter failure on the later more difficult items. The tasks as administered to the main experimental groups are described below.

1. *Auditory Memory.* This task (Digit Span) consisted of sets of digits of increasing length. The subjects were instructed as follows: "I am going to say some numbers. Listen carefully, and when I am through, say them right after me."

The experimenter read the digits at the rate of approximately one per second, beginning with the shortest series, which consisted of two numbers. If a subject repeated the digits correctly, the next longer series was given without comment by the experimenter. In the case of incorrect repetition the subject was permitted three trials for a given series length before it was considered failed. The subjects in the main experimental groups were informed of failure whenever it occurred by the statement: "That was wrong; now listen carefully and be sure to get them just right."

Series up to a length of two digits beyond their just-determined memory span were administered to the subjects, providing a minimum of six successive failures. Following these failures the alternate form was administered in descending order of difficulty beginning with a series length one digit beyond the just-determined memory span to allow for possible improvement. The next shorter series was given when a subject had failed a set of three trials or had correctly repeated one trial. The descending order was terminated when the shortest series had been reached.

Three points were given for the correct repetition

of any given length of digits on the first trial; two points for the correct repetition on the second trial; and one point for the correct repetition on the last trial. The score obtained on the form of each task administered in ascending order of difficulty (until the specified number of failures was encountered) is hereafter referred to as the *prefrustration* score; the score obtained on the form of each task following failure is referred to as the *postfrustration* score. The *drop* score (postfrustration score subtracted from the prefrustration score) was calculated for each subject. In each of the following tasks drop scores also were calculated in an identical manner.

2. *Visual Memory.* The Benton Visual Retention Test (1) was employed. It consists of two forms of seven cards each, upon which one or more geometrical figures are drawn in india ink. The subjects were instructed as follows: "I am going to show you some cards on which there are one or more designs. You will be given a short time to study each card. Then it will be removed and you will draw what you have seen." The subject was given a pencil and blank paper approximately the same size as the cards (5×8 inches). At card number three (the first card with more than one design) the subject was reminded: "Don't forget to draw everything you see."

Each card was presented to the subject for five seconds and then removed. (Standard administration time is ten seconds.) Because of the brevity of this task and the likelihood of partial successful reproduction even on the difficult items, all seven cards in each form were administered. The prefrustration form was administered in ascending order of difficulty and the postfrustration form in descending order. When the subject incorrectly reproduced or omitted any part of the figures on a card, he was told: "That was wrong; look at the next design carefully and be sure to draw everything you see." In the case of correct reproduction no comments were made.

A more sensitive scoring system than the one used by Benton was developed which took into account the shape of the figures (or figure), their horizontal order, their vertical position, and their relative size. Approximately two points were scored for each figure, less points subtracted for inaccuracies.

3. *Auditory Perception.* The test consisted of two recordings of 54 spondaic words (a term used in verse referring to a foot of two long syllables) at nine graded intensity levels. The words were selected from a list of 70 spondaes prepared by the Harvard Psycho-Acoustic Laboratory (16). The list originally was intended to supply a relatively large number of homogeneous items to measure the threshold of

hearing for words. Each form of the test designed for the present study consisted of 27 different spondee words recorded at nine different levels of intensity. There were three words in each of the nine different steps.

In the recording process all of the 54 words were spoken at a constant level through a calibrated amplifier into the recording device. After each step of three words was spoken, the intensity level of the amplifier was reduced by three decibels until the nine steps (27 words) in the first form had been recorded. For the second form the intensity level of the amplifier was increased after each step by three decibels. Another recording in which the forms were alternated was made in an identical manner to permit rotation of the forms.¹

A portable phonograph equipped with two sets of headphones was used to play the recording during the experiment. The headphones worn by the subject were of the type used by the Army Air Forces. They had two large sponge rubber cups which fitted over the ear pieces and tended to reduce external noises. The experimenter wore a single earphone to monitor the recording. The subjects were instructed as follows: "I am going to play a recording of some spoken words. Your job is to repeat the word as soon as you hear it. If you have any difficulty, you should guess because you may get it right. They are all familiar, meaningful words." The subject then was given the headphones.

There were intervals of approximately three seconds between the words to permit repetition of the word by the subject. Usually, an interval of six seconds was allowed between successive steps, but when comments by the experimenter were required, the interval was longer.

The volume control was set initially at a low intensity level (a point determined during trial runs at which none of the persons tested could identify more than half of the six syllables (three words) in the seventh step of the first form. Those subjects who correctly identified the three words in the first step continued on to the next steps; the volume-control dial remained fixed. When a subject encountered difficulty in identifying all three words in the first step, the same step was repeated with the comment: "Let's try it again to get used to it." If a subject still was not successful, the volume was gradually increased until a point was reached where he could identify all the words in the first step. The test then was continued and the volume-control dial remained

fixed at the new position throughout the presentation of the two forms.

When a subject had incorrectly identified or omitted three of the six syllables within a step (after the first), the turntable was stopped and the subject informed of failure. In the case of incorrect responses the subject was told: "That was wrong; now listen carefully and be sure to get the next ones right." If no responses were made, the subject was asked: "What words did you hear?" If incorrect responses were given, he was informed of his errors. When no guesses were offered, he was told: "You missed those words; now listen carefully and be sure to get the next ones right." No comments were made when more than three syllables in any one step were identified correctly. The recording was played in its entirety for all subjects in the main experimental groups regardless of the subjects' limens.

One point was given for each syllable correctly identified. The first step of the prefrustration form and its equivalent step in the postfrustration form (i.e., the loudest step) were given full credit since all subjects were required to respond correctly to the very first step.

4. *Visual Perception.* The test consisted of two forms of 15 blurred words arranged in order of difficulty of identification. In order to control for differences in the familiarity of words, the thirty words were selected from the thousand most frequently used words in the Thorndike and Lorge lists (14). Each word was seven letters long and no letter was repeated within any one word. Varying grades of blurredness were obtained by typing the words on bond paper and making 14 carbon copies. Six different words were typed on each sheet; they were typed in capitals with the letters an additional space apart to prevent them from merging into each other in the blurring process. The sixth, eighth, tenth, twelfth, and fourteenth copies were used. The five carbon copies (30 different words) then were photographed on 35-mm. negatives. In the reproduction process the words were enlarged to approximately original size. Each word was on a separate 3×4-inch card of doubleweight, glossy enlarging paper. The order of the difficulty of identification of the words was determined by the performance of a group of normal subjects. The words were placed in rank order and divided into two equivalent forms.

The subjects were told: "I am going to show you some photographs of words. These words will be blurred, but your job is to read each word. If you have any difficulty in reading these words, you should guess because you may get them right. They are all familiar, meaningful words. For example, read this one." The subject was given the first card. Whenever a sub-

¹ The author is grateful to Dr. M. Bergman, Assistant Chief of the Audiology Clinic at the Veterans Administration New York Regional Office, for making the recordings.

ject indicated that he could not respond, he was instructed: "See what letters you can make out and then take a guess." No comment was made if a subject correctly named four of the seven letters or gave a seven-letter word with four or more letters correctly identified in the proper positions. If a word other than one with seven letters was given, the subject was asked to spell the word. Usually the subject indicated which letters he had used.

When a subject incorrectly identified four or more letters in a word, he was informed: "That was wrong." (In the case of no response: "You missed that one.") "Be sure to study the next word carefully." After the first failure, the correct word was named by the examiner. Since a blurred word can generally be recognized after it has been identified, this procedure tended to assure most subjects that the stimuli consisted of real letters and were not merely "smudges," or "fingerprints," or "ink blots."

The main experimental subjects were allowed three successive failures in the prefrustration form (ascending order of difficulty) before being given the postfrustration form in descending order of difficulty. The postfrustration form began with a word at the same level of difficulty as the last word failed in the prefrustration form. A score of one point was given for each letter correctly identified.

B. PRELIMINARY EXPERIMENT

1. *Purpose.* A defect in one of the previous frustration studies (2) was the lack of consideration given to initial differences in behavior between schizophrenic and normal individuals. For example, even in nonfrustrating situations it has been shown that schizophrenic individuals are unable to maintain effective mental sets for as long a period as normals (12). In addition schizophrenic patients are more likely to discontinue tasks of their own accord (10). Attention and concentration difficulties also are characteristics of schizophrenic behavior. Despite the brevity of the experimental tasks, these behavior tendencies might result in a decrement in performance merely due to the length of the tasks. It was necessary, therefore, to determine the extent to which such variables related to

the length of the tasks might affect adversely the performance of schizophrenic subjects under conditions of minimal frustration.

2. *Population.* The 24 male patients employed in this preliminary study were obtained from the population diagnosed as schizophrenic at the Veterans Administration Hospital, Northport, New York. They ranged in age from 22 to 35, with a mean age of 27.6 years. The patients had been hospitalized from several months to over seven years, with a mean length of hospitalization of 3.5 years. All subjects had been raised in New York or immediately neighboring states and had completed from 8 to 15 grades in school, with a median educational level of 11.0 grades. Their IQ's, roughly estimated by prorating their combined Vocabulary and Information subtest scores of the Wechsler-Bellevue Scale, ranged from 92 (a combined weighted score of 17) to 127 (a combined weighted score of 27), with a mean of 110 (a combined weighted score of 21.9).

3. *Procedure.* After administration of the Vocabulary and Information subtests of the Wechsler-Bellevue Scale, the four tasks were presented to each subject individually in a single session. Since it was desired to determine the cumulative effect of the variables related to the length of the tasks, it was necessary to control for position and for the possible effects of one task upon another. The orders of presentation of the four tasks were completely rotated, yielding 24 different orders. Thus every task appeared in each of the four positions, and followed directly each of the other tasks, an equal number of times. The alternate forms of each task also were rotated to eliminate differences in achievement resulting from possible inequality of the two forms.

In order to determine the subjects'

maximal levels of performance, failure could not be eliminated completely. A condition of minimal frustration could be obtained most effectively by making the number of successive failures as few as possible. The two forms of each task were administered, each in ascending order of difficulty. In the Digit Span task each form was terminated after three successive failures (a series length one digit beyond the just-determined memory span) instead of six as in the main experiment. In the Auditory Perception task each form was terminated after the subject could no longer identify any syllables in two successive steps. As in the main experiment, all of the Benton Visual Retention Test cards were presented and the Visual Perception task was continued until three successive failures had occurred. While the subjects were urged to guess when omissions were made, they were not informed of failure. Those subjects who appeared disturbed by failure were assured they had made a good try.

4. *Results.* No significant differences were found between the mean scores of the forms administered first and those administered second. The t values obtained ranged from 0.56 to 1.06. (With an n of 23, t must be greater than 1.70 to be significant at the 0.10 level of confidence.) Pearson correlation coefficients between the first and second forms of each task ranged from 0.68 to 0.87. Although the size of the sample might tend to increase the possibility of negative results, no trend suggestive of a decrease in performance is evident between the forms administered first and those administered second. Three tasks showed slight increases in the scores of the forms administered second; the Digit Span task showed a slight drop. The results are consistent with the assumption that any

differences between forms obtained in the main experimental groups would be due to the introduction of the experimental variable.

In order to determine the effects of the position of the task on the initial performance of each of the four tasks and on the difference scores (form administered first minus form administered second), the raw scores in each task distribution were converted to standard scores. Each subject's scores then were arranged in a row according to the position in which the task was administered regardless of the nature of the task. An analysis of variance technique was employed to discover if any differences due to the position of the task existed. For the initial form scores of each of the four positions the analysis of variance technique yielded a *between-positions* variance ratio of 1.06, which is not significant. In addition, examination of the mean initial scores for the four positions revealed no consistent trends. For the difference scores the *between-positions* variance ratio also was not significant (1.18); the mean difference scores revealed no consistent trends. Thus the results are consistent with the assumption that any obtained positional effects in the main experimental groups are due to the cumulative effects of frustration.

C. MAIN EXPERIMENT

1. *Population.* There were two groups of subjects, a schizophrenic group and a normal group. The psychotic group was composed of 48 white male patients diagnosed as schizophrenic at the Veterans Administration Hospital, Northport, New York. They had been hospitalized for periods ranging from one to nine years, with a mean length of hospitalization of 4.75 years.

The normal group was composed of 48

white male patients hospitalized for minor surgery at the Veterans Administration Hospital, Bronx, New York. The following criteria of normality were employed: (a) hospitalization for relatively minor operations; (b) recommendation by the ward personnel as a suitable candidate on the basis of the absence of obvious behavior deviations; (c) no indication of previous mental disturbance nor of any present need for psychiatric treatment in the patient's medical history; (d) a screening interview by the experimenter prior to testing, in which the patient was questioned about previous illnesses, basis for discharge from service, and reasons for disability pensions, if any. Any patient whose mental status was doubtful was not accepted as a subject.

The groups were equated approximately for age and for intellectual and educational level. All subjects came from New York or immediately neighboring states. Ages ranged from 22 to 40 years, with a mean age of 30.77 for the schizophrenics and 30.00 for the normals. The estimated mean IQ's for the psychotic group and the normal group were 108 and 110 respectively (prorated from the Vocabulary and Information subtests), with a range of 86 to 128. The subjects had from 6 to 16 years of schooling, a mean of 11.31 years for the schizophrenics and a mean of 10.90 years for the normals.

A minimal intellectual level of Dull Normal ability (an IQ of 80) had been established to eliminate severely deteriorated psychotic patients. While the experimental battery was not administered to those individuals who failed to attain this level, the minimal need requirements (successful performance in the initial items of each task to obtain a score equal to three completely correct responses) also tended to disqualify the

more confused and less compliant schizophrenic patients.

2. *Procedure.* All subjects were told that the psychologist was in the process of devising some new tests of different abilities, and that it would be appreciated if they would help him out by taking the tests. Most of the schizophrenic patients had received psychological examinations previously and usually submitted without further explanation. The surgical patients were unfamiliar with psychological tests for the most part and required more elaborate explanations. The exact wording of the introductory interviews varied with the patients' educational backgrounds and personality characteristics. Essentially they were told that the psychologist was working on a research project designed to compare the abilities of mentally ill and normal people through the use of some new tests. Normals were needed to form the basis for the comparison. All questions concerning the basis for selection and the tasks involved were answered as honestly as possible without revealing the true nature of the experimental variable.

The administration of the experimental battery to the main experimental groups was the same as the administration to the preliminary group except for the addition of the experimental variable as described earlier in this chapter. (See A. Materials.) The orders of presentation of the tasks were completely rotated twice within each group and the forms of each task also were alternated.

The failures encountered in the test situation tended to disturb the subjects in varying degrees. Primarily as a basis for reassurance, a brief interview (developed after five schizophrenic patients had been tested) was conducted with each subject at the end of the experimental session. The subjects were asked the following questions:

- a. What do you think of these tests?
- b. How do you think you made out?
- c. How did you feel when you failed or got something wrong?
- d. Which was the easiest and which was the hardest test?

If a subject's responses indicated that he was disturbed, he was assured that it was natural to feel upset, but that he had performed as well as or better than most people in his educational level. It was pointed out that psychological tests were analogous to the high jump or pole vault in sports. The athlete continues to jump

until he misses several times. Unless he does miss, one could not know how high he might have gone. Because these were new tests, it was necessary to make certain that the subjects had reached their highest level. It also was suggested that the items that had been failed in the most difficult test were practically impossible.

II. RESULTS

A. QUANTITATIVE DIFFERENCES IN FRUSTRATION TOLERANCE

1. *Drop Scores.* For each task *drop scores* (i.e., the *postfrustration* score subtracted from the *prefrustration* score) were employed as measures of the adequacy of the subjects' performance following frustration. A large drop score indicates a low frustration tolerance.

The results clearly indicate that differences between schizophrenics and normals exist in their ability to withstand frustration. In all tasks the schizophrenic group showed significant mean drop scores (beyond the .001 level of confidence). On the other hand, the normal group manifested no reduction in the adequacy of performance following frustration in the perceptual tasks. The mean drop scores of the normals in the two perceptual tasks are well within chance limits. In the two memory tasks the normal group displayed drops in performance after frustration that were signifi-

cant at the .035 level of confidence for the Digit Span task and at the .08 level of confidence for the Benton.

Comparisons of the mean drop scores of the two groups reveal that in all tasks the schizophrenic group consistently manifested a greater quantitative reduction in performance following frustration than the normal group did. The consistently poorer performance of the schizophrenic group as compared with the normal group following frustration tends to support the hypothesis that schizophrenics have a lower frustration tolerance than normals. The drop score means, standard deviations, and critical ratios of the two groups for each task, and the comparisons of the mean drop scores, are presented in Table 1.

2. *Prefrustration Performance.* Despite the approximate equality of the two groups in regard to Vocabulary and Information scores and educational levels, differences in the prefrustration mean

TABLE 1
DROP SCORE MEANS, STANDARD DEVIATIONS, AND CRITICAL RATIOS OF THE SCHIZOPHRENIC (S) AND NORMAL (N) GROUPS FOR EACH TASK, AND COMPARISON OF MEANS OF THE TWO GROUPS

	Digit Span		Benton		Aud. Per.		Vis. Per.	
	S	N	S	N	S	N	S	N
Mean	2.98	.67	2.98	1.12	4.92	1.08	10.38	.35
SD	2.73	2.20	4.11	4.42	6.04	4.72	13.39	9.84
CR	7.64	2.09	4.88	1.75	5.66	1.59	5.38	.25
CR	4.51		2.13		3.46		4.18	
P level	<.001		.033		<.001		<.001	

scores occurred in the Visual Memory and Visual Perception tasks. It is in these tasks that appreciable correlations between the prefrustration scores and the drop scores exist. For the Benton the Pearson correlation coefficients for the normal and schizophrenic groups are 0.52 and 0.29 respectively; for the Visual Perception task 0.37 and 0.43 respectively. These correlations probably are due largely to the unreliability of measurement. Extreme prefrustration scores are likely to include a considerable element of chance error which may not occur in the subsequent (postfrustration) trials with consequent regression toward the mean (the higher the prefrustration score, the bigger the drop score). In the two auditory tasks the correlations between prefrustration performance and drop score are considerably smaller and insignificant (0.20 or less).¹

The obtained differences between the mean drop scores of the two groups in the visual tasks, therefore, are affected by the differences in prefrustration performance scores between the groups. In the Benton the fact that the schizophrenic group obtained a lower prefrustration mean score implies that, had the psychotic group attained the same prefrustration level as the normal group, the schizophrenics' mean drop score probably would have been larger than the obtained drop score. Statistically controlling for the difference in prefrustration performance by means of an analysis of covariance technique yields adjusted mean drop scores of 3.66 for the schizophrenic group and 0.38 for

the normal group. The significance of the difference between groups then is increased to beyond the .001 level of confidence. (F equals 13.92; n_1/n_2 equals 1/93.)

In the Visual Perception task the difference between the initial mean scores of the two groups is reversed; the schizophrenic group obtained a somewhat higher prefrustration mean score. An analysis of covariance technique yields adjusted mean drop scores of 9.38 for the schizophrenic group and 1.50 for the normal group. While the difference between drop score means is reduced, the significance of the difference is still beyond the .001 level of confidence. (F equals 11.97; n_1/n_2 equals 1/93.)

B. QUALITATIVE DIFFERENCES IN REACTION TO FRUSTRATION

Various writers have emphasized different types of reaction to frustration. The Yale group (3) dealt exclusively with aggressive reactions, recognizing that they largely ignored consequences of frustration other than aggression. Symonds (13) treated somewhat more extensively these other consequences, such as constructive methods and substitute responses. In the latter category he listed abandoning the goal, repeating behavior, fantasy, regression, and miscellaneous reactions. Maier's experiments (7) were concerned with stereotyped, fixated behavior, but he also recognized the existence of other responses such as aggression, regression, and resignation (the lack of overt behavior).

The present experimental design was such that not all the different methods of reacting to frustration were elicited. For example, there was no clear-cut evidence of behavior that could be classified as regressive. In addition the relatively mild stress employed to induce frustration generally did not disrupt behavior to an ex-

¹It is of interest to note that in the auditory tasks the physical differences between successive steps were equal (an increase or decrease of one digit in the memory task and of three decibels in the perceptual task). In the visual tasks the intervals between successive steps probably were more variable, which may have contributed to the greater unreliability of measurement.

TABLE 2
P LEVELS¹ AND Dfs FOR THE QUALITATIVE DIFFERENCES BETWEEN GROUPS

	Before Frustration		During Frustration		After Frustration	
	P level	df	P level	df	P level	df
Aud. Per. Omissions	.70	3	.98	3	.02	3
Vis. Per. Omissions	.70	1	.20	3	.01	2
Aud. Per. Guesses	.90	3	.01	3	.80	3
Perseverative Errors	.20	1	.001	2	.05	2
Vis. Per. Response Time	.30	2	.70	3	.05	1

¹ Only the larger of the two P-level values between which the chi-square value falls is given in this table.

treme degree. The kinds of reactions that did occur tended to be less spectacular than those obtained by other experimenters under conditions of greater stress.

The quantitative reduction in the post-frustration scores was a result of an increase in errors. For the most part errors consisted of either totally incorrect responses (guesses) or refusals to respond (omissions). Some understanding of the basis for the difference in frustration tolerance between the schizophrenics and the normals may be obtained by analyzing the types of errors made.

A chi-square technique was employed to compare the two groups in the perceptual tasks with respect to such qualitative factors as the occurrence of omissions, guesses, and length of time for responses. The two perceptual tasks were divided into three parts for the comparisons: (a) the *before frustration* section in which subjects in both groups experienced mostly success; (b) the *during frustration* section in which all subjects experienced failure; (c) the *after frustration* section which was equivalent in item difficulty to the before frustration section. The P levels and degrees of freedom of the chi-square tables for the qualitative variables are presented in Table 2. For the after frustration section the P levels reflecting the difference between the groups were calculated on the basis of the change in

the number of omissions, number of guesses, number of perseverative errors, and time scores for each individual (number in the before frustration section subtracted from the number in the after frustration section). The change rather than the absolute count is a more accurate measure of the effect of the intervening frustration.

1. *Abandoning the Task.* A tendency to abandon a task can be inferred from the change in the number of omissions made following frustration. An *omission* means that a subject refused to attempt to identify any part of a stimulus in the perceptual tasks. It should be recognized that a refusal to respond when the goal is unattainable is not necessarily an inadequate mode of behavior. The individual who correctly evaluates a situation as impossible may be justified in abandoning the task. Nothing would be gained by expending energy in a fruitless search for a response for which sufficient guiding cues are unavailable. However, to continue to abandon the task when success is possible is clearly inadequate behavior.

In the Auditory Perception task most subjects in both groups (28 normals and 27 schizophrenics) made one or less omissions during the before frustration section (steps 1 through 6 of the prefrustration form). When success became unlikely during the six most difficult steps, omissions increased, but the number of in-

dividuals in each group refusing to respond to one or more items remained approximately the same. The majority of the subjects (29 normals and 27 schizophrenics) made eight or more omissions during frustration. In the after frustration section (steps 6 through 1 of the postfrustration form), however, 29 schizophrenics (60%) increased the number of omissions, whereas only 18 normals (38%) did so. (See Table 2 for the *P* values of the obtained differences between groups.)

In the Visual Perception task no significant differences between groups were manifested before frustration (those items prior to the three consecutive failures). Almost all subjects (43 normals and 41 schizophrenics) made no complete refusals to respond. During frustration (the six most difficult items) omissions increased with all but nine normals and fourteen schizophrenics making one or more omissions. After frustration (those items in the postfrustration form equivalent in difficulty to the items in the before frustration section) fifteen schizophrenic subjects (31%) showed an increase of two or more omissions, whereas only four normals (8%) showed an increase of as many as two omissions. (See Table 2 for *P* values.)

The results indicate that it was only after frustration, when the goal again became attainable (as judged by each subject's level of performance prior to frustration), that differences between the groups became evident. More schizophrenic than normal individuals increased the number of omissions after frustration. Many schizophrenic subjects were unable to offer responses to items of a level of difficulty in which they had been successful prior to the frustrating experience.

A tendency to abandon a task can also

be inferred from the time spent in attempting to discover a correct response. Each subject's average time for response to the blurred words was calculated for each section of the Visual Perception task. These final response-time scores showed a great deal of variation within as well as among individuals. On the less blurred words responses were made rapidly by most subjects, whereas on the more difficult items some subjects kept on trying to identify a word for as long as two minutes. In the before frustration section more schizophrenics (23%) than normals (10%) displayed extremely long reaction times (twenty or more seconds), but the difference between groups is not significant. No differences were evident during frustration. After frustration 22 normals (46%) decreased their average time spent per card, whereas 32 schizophrenics (67%) decreased their average response times. (See Table 2 for *P* values.)

These results are in accord with the findings regarding omissions. Thus, one of the factors contributing to the lower frustration tolerance in the schizophrenic group is their tendency to withdraw from the situation after having encountered frustration.

2. *Perseverative Behavior.* In the before frustration section of the Auditory Perception task the number of subjects in each group making one or more completely incorrect attempts to respond (guesses) was approximately the same (29 normals and 26 schizophrenics). In the after frustration section there also was no significant difference between groups in the number of subjects increasing the number of guesses. The major portion of both groups (30 normals and 28 schizophrenics) made as many or fewer guesses in the after frustration section than in the before frustration section. During frustration, however, when virtually no

useful perceptual cues were present, the schizophrenic group made significantly more guesses than the normal group. In this most difficult section of the task, 11 normals made from four to eight guesses, whereas 28 schizophrenics made from four to thirteen guesses. (See Table 2 for *P* values.)

Examination of the nature of the guesses revealed that some guesses appeared to be perseverative errors consisting in part of words or syllables that were direct repetitions of responses offered earlier in the test. In addition the records show conceptual perseverative guesses—the perseveration of an idea rather than a specific syllable or word (e.g., "baseball, football, soccer," or "piano, Mendelssohn, flute" offered in immediate succession). In the former example, "football" was classified as a perseverative error because of the incorrect repetition of the syllable "ball." This response also could be classified as a conceptual perseverative error along with the immediately following term "soccer." In the second example only the last two words were classified as perseverative guesses. The initial incorrect response "piano," which apparently provided the cue for the later responses, was classified as a nonperseverative guess. If one syllable of a two-syllable response correctly identified part of the stimulus word, the response was not classed as a guess despite the fact that the incorrect syllable might have been a perseveration.

Although somewhat more individuals in the schizophrenic group (25%) than in the normal group (15%) made perseverative errors in the before frustration section, the difference between groups is not significant. During frustration the difference was increased markedly with 33 schizophrenics (69%) and 18 normals (38%) making such errors. After frustration 15 schizophrenics (31%) and only

six normals (12%) manifested an increase in the number of perseverative guesses. (See Table 2 for *P* values.)

Twelve schizophrenic patients made from four to eleven perseverative attempts, whereas only one normal made more than four perseverative guesses. In several of these extreme cases the behavior during and following frustration resembled in some degree the fixated, stereotyped behavior that Maier (7) and others (8, 13) have described.

While perseverative attempts did not appear to be directed at the goal which the experimenter had established, they cannot be considered samples of unmotivated behavior. It is important to recognize that the subjects had been told to guess when difficulty was encountered. The excessive number of perseverative responses made by some schizophrenic subjects suggests that they probably were complying mainly with the instructions to guess; i.e., merely to offer a response had been substituted for the original goal of identifying the spoken word. Many schizophrenics continued to respond in this perseverative manner even when the spoken words were loud enough to be identified (as determined by their performance prior to frustration). From the results obtained, however, it appears that for the vast majority of the normals the instructions to guess were not substituted for the instructions to identify the actual stimulus.

In regard to guesses in general it is of interest to compare the results in the Auditory Perception task with the findings of the Postman and Bruner study (9). Using an experimental and a control group of normals in a visual-perception task, Postman and Bruner subjected the experimental group to a large number of successive failures accompanied by "bitingly disruptive criticisms." The frus-

trated normals made more guesses including obviously inadequate attempts (meaningless phrases) than the control group.

The stress situation used by Postman and Bruner appears to have been much more severe than the one employed in the present experiment. During the mild failure situation the normal group made relatively few guesses. The schizophrenic group, however, reacted much more severely to the similar stress, making many more guesses, including the obviously inadequate, perseverative attempts. These findings suggest that the responses of schizophrenics to relatively mild stress may resemble those of normals to severe frustration.

3. *Mode of Incorrect Response.* Although omissions and guesses were errors which contributed to the reduction of scores following failure, to make an attempt to respond when the goal is again attainable should be a more desirable form of behavior than to refuse to try. The relative adequacy of the two forms of behavior can be inferred from the relationship between the mode of incorrect response after frustration and the size of the drop score. In the after frustration section of the Auditory Perception task 25 normals and 29 schizophrenics made more omissions than guesses (*omitting mode*) obtaining mean drop scores of 3.00 and 4.66 respectively. The 23 normals and 19 schizophrenics who made as many or more guesses than omissions (*guessing mode*) obtained mean drop scores of -1.00 and 5.00 respectively. In the normal group a biserial correlation coefficient of 0.60 ($\text{sigma } r_b = 0.13$) exists between the omitting mode and the size of the drop score. This suggests that for the normals to make no attempt rather than guess after frustration has been encountered is a less adequate mode of be-

havior. No relationship is evident in the schizophrenic group where the biserial correlation is -0.04 ($\text{sigma } r_b = 0.18$). Apparently it made little difference whether the schizophrenic patients chose to omit or to guess, since many of their guesses were inadequate (perseverative) attempts.

4. *Bizarre Behavior.* On the whole a relatively small number of the schizophrenic subjects and none of the normals manifested any form of bizarre behavior that could be related to the experimental frustration.

a. *Nonsense Word Responses.* Language disturbances are frequent concomitants of schizophrenic disorders. One phase of such disturbances is the use of words that have meaning only for the individual. In the Visual Perception task many normals as well as schizophrenics offered spelled responses that did not resemble meaningful words. Some subjects spontaneously commented that the response was not a real word; others admitted that the response was not a real word after being asked to define it. A meaningless response was classed as a nonsense word only when the subject defined it in some manner or stated that he believed it to be a real word. The following are examples of nonsense words given by schizophrenic patients:

Fronise—confronting or facing.
Enicely—inflicting upon property.
Osfaze—a process applied to poetry.
Altrslt—a Harvard University graduation.
Figure—like an ashtray.

Responses that were only slight distortions of real words and defined accordingly were not classed as nonsense words. The response "Oculary," defined as "something to do with the eyes," was apparently a distortion of the word "ocular." Similarly, the response "Oswasso," defined as "a town in Michigan," was

presumably a distortion of Owosso which is a town in that state.

In the schizophrenic group 13 subjects gave a total of 85 nonsense word responses, and defined most of them. Two normals gave a total of three words that were meaningless, and only one word was actually defined. Both normals had obtained very low Vocabulary scores.

It had been hypothesized that schizophrenics would resort readily to the use of nonsense words during and after frustration. The 85 nonsense words, however, were distributed fairly evenly among the before, during, and after frustration sections of the task (26, 31, and 28 nonsense words respectively) suggesting that responding with nonsense words was not a direct result of the experimental frustration. The use of nonsense words for these subjects appeared to be an habitual, uncritical means of dealing with the environment.

As in the case of perseverative guesses, offering nonsense words may reflect attempts on the part of the subject to comply with the instructions to guess. Seven (54%) of the 13 schizophrenic subjects who gave such meaningless responses made no omissions in this task. Of the 35 psychotic subjects who were more critical of their responses, a considerably smaller percentage (17%) made no omissions.

The patients making such meaningless responses also appear to have been less adversely affected by the frustrating experience than the psychotic individuals who were more critical of their responses. The tendency to give nonsense words is related negatively to the size of the drop score in the schizophrenic group. The biserial correlation coefficient between the presence of nonsense words and the size of the drop score is -0.46 , with a standard error of 0.16 .

b. Hallucinations. Hallucinations were observed in three schizophrenic patients during the experimental sessions. In one instance the hallucinations appeared to be induced by the failures in the final task.² For another patient the hallucinations resulted in a complete withdrawal from the reality situation. When the spoken words became too low to identify, he began to carry on what appeared to be a radio conversation and was oblivious to the actual task thereafter. A third subject merely reported seeing "a purple band of light while the record was playing," but there is little evidence to suggest that this hallucination was a consequence of frustration.

c. Fantasy. The use of fantasy to deny frustration may be inferred from the statements of four psychotic patients at the conclusion of the testing situation. Three of these subjects denied that they had failed or that they had encountered difficulty with any of the items in the tasks. One patient reported that he had made "a hundred per cent" in all the tasks.

It appears then that some forms of bizarre behavior (such as hallucinations and fantasy) may occur as a consequence of relatively mild frustration in a small number of schizophrenic patients. Other forms of bizarre behavior (such as the use of meaningless words) are more likely to be habitual means of dealing with the environment.

5. Report of Feelings. The descriptions of feelings, obtained in response to the question on how the subject felt when he had failed, were classified into two major

²The following are excerpts from his remarks after encountering failure in the Digit Span task: "I give up. I can't do the test. I'm jamming my brain. . . . Lousy IQ. I hate you, you bastard. So you got a higher IQ. . . . He's jamming me with the radio. Turn it off. Let me listen to the psychologist. . . ."

types. One fairly clear-cut category included responses which indicated that the subject recognized and *accepted* unpleasant feelings. The other category, considerably broader, consisted of varied *defensive* reactions. Included in the defensive reactions were all verbalizations in which the subjects directly denied any painful experiences, or in which they avoided discussing their feelings. The avoidance of discussion of feelings was accomplished in essentially three ways: (a) denial of ego involvement in the tasks, thus implying that they were not disturbed in any way; (b) mere description of the failure situation; and (c) denial that they had failed (exclusively a schizophrenic mechanism).

It was generally quite difficult for most subjects to express their feelings in words. The responses of all the normal subjects, however, were classifiable. Several schizophrenic subjects appeared to be bewildered by the question; they apparently did not understand what was expected or could not describe their feelings. Other than the repetition of the question, no pressure was put upon the individual to respond. Hence, "I don't know" replies were not classified.

It seems that for the vast majority of the subjects the terms "failed" and "wrong" in conjunction with feelings connoted unpleasantness, since most of the replies to the question, including denials, referred to specific unpleasant emotions. Examples of the types of responses given by the normals (N) and the schizophrenics (S) are listed below.

Acceptance of Unpleasant Feelings:

I mean —. I knew —. How can I feel — a little stupid. (N)

I felt that I should have studied more. I felt more willing. I wanted to concentrate. I wanted to open my ears even though you can't. (N)

Depressed naturally, they were simple enough. (N)

On the numbers I didn't mind too much. On the others I felt a little ashamed. Gee whiz! They're so easy you know — for a guy who graduated from high school. (N)

I felt hurt. I said to myself I must be stupid. (N)

You feel miserable. I tried harder. (S)

I didn't — just badly. I felt like weeping when I failed continuously, made one (mistake) after the other. (S)

I have nervous heart trouble. (S)

Badly, I wanted to find myself in better condition. (S)

I can't stand it; that's the truth. I'm trying. (S)

Defensive Reactions:

It didn't annoy me. (N)

I didn't feel badly about it at all. (S)

I haven't got anything to gain or lose so there's no reason for feeling bad. (N)

Well it didn't matter to me whether I got it right or wrong because I wasn't taking the test for a reason. (S)

I got it wrong. I didn't know it that's all. (N)

Just went to the next one. (S)

I never fail. (S)

I couldn't be wrong. You've got to be right or commit suicide. (S)

In reporting these statements the emotional qualities in the subject's speech and manner cannot be conveyed. In addition the introspective reports, especially the defensive reactions, do not reflect the individual's actual behavior in many cases. For example, a normal, who denied any concern about his failures, returned several days later to ask for his score. A schizophrenic subject, who reported that he didn't "give a damn" if he passed or failed, was so severely disturbed during failure items in one task that hallucinatory behavior occurred.

In the schizophrenic group^a 58 per cent of the subjects whose responses could

^a A standard set of questions was developed after the first five subjects in the schizophrenic group had been tested. In order to increase the number of subjects, the interview data of nine additional schizophrenic patients were pooled with the data of the experimental group. These additional subjects had been tested to provide a source of substitutes for equating the two experimental groups.

TABLE 3
FREQUENCY OF TYPES OF RESPONSES TO INTERVIEW QUESTIONS

Interview Question	Type of Response	Normal N=48	Schiz. N=57
How did you feel when you failed or got something wrong?	Acceptance	32	20
	Defensive	16	28
	"Don't Know"		3
	No Reply		1
	Not Questioned		5
How do you think you made out?	Average or Above	18	27
	Below Average	29	17
	"Don't Know"	1	5
	No Reply		3
	Not Questioned		5
Which was the easiest test?	Digit Span	2	8
	Benton	26	15
	Auditory Perception	17	19
	Visual Perception	3	6
	No Decision		6
	Not Questioned		3
Which was the hardest test?	Digit Span	24	17
	Benton	2	11
	Auditory Perception	2	4
	Visual Perception	20	16
	No Decision		6
	Not Questioned		3

be classified tended to react defensively. In the normal group only 33 per cent reacted defensively. The numbers of subjects in each category are shown in Table 3. A chi-square test of the difference between groups in regard to the number of individuals in the *acceptance* and *defensive* categories is significant between the .01 and .02 levels of confidence.

6. *Estimate of Level of Performance.* A subject's opinion of his performance was obtained from his response to the question: "How do you think you made out?" The self-evaluations in the schizophrenic group ranged from complete denial of the reality situation ("a hundred per cent in all of them") to admission of poor performance ("I think I made out bad"). The normals were less grandiose in their estimates, which ranged from a high of "about average, maybe a little above," to "pretty crummy."

In order to permit comparison of the responses of the two groups, the esti-

mates were divided into two categories: *average or above* included statements which suggested that the individuals believed they had made an "average" or a "fair" or at least a "not too bad" score, *below average* included all statements which suggested that the subjects were critical of their performance.

More schizophrenic subjects (61 per cent of those whose responses could be classified) than normals (38 per cent) estimated their performance at the average or above level. A chi-square test of the difference between groups in regard to the number of individuals in the two categories is significant between the .02 and .05 levels of confidence. The number of subjects in each category is shown in Table 3.

7. *Difficulty of the Tasks.* Only a few subjects explained the basis of their ratings of task difficulty. Their comments suggest that the number of failures encountered was probably a major factor

in influencing the ratings. In several instances, as the following comments indicate, task difficulty was judged by comparing the number of failures in the different tasks:

They seemed equally hard, but I think I missed more on the numbers.

I only missed out on about three drawings so they would be the easiest.

Other comments suggested that the subject had anticipated better performance (i.e., fewer failures) in that particular task because of his specific needs:

I know I have very good eyesight, and I don't know why I couldn't read them (the blurred words).

The numbers for me . . . I felt it would be rather easy to remember them.

The ratings of the four tasks are shown in Table 3. The Digit Span and Visual Perception tasks appear to be the most difficult; the Benton and Auditory Perceptions tasks were rated most frequently as the easiest. The groups are in close agreement except for the Benton, which was rated as most difficult by 11 schizophrenics but by only 2 normals. The fact that the schizophrenic group performed more poorly in this task than the normal group tends to add credence to the judgments.

8. Aggressive Reactions. During the testing situation several schizophrenic patients made hostile comments. One psychotic individual, the only subject who refused to continue with the tasks after encountering failure, was frankly critical of the examiner. Via his hallucinations one schizophrenic directed his aggression at the "voice." In between failures a third patient warned the psychologist to "watch out for the pen. You might get it stuck; it's sharp." Among the normals there were no obvious expressions of aggression directed at the examiner. During the experimental session their comments consisted mainly of self-criti-

cisms and rationalizations for failure. Even at the conclusion of the experimental battery, when asked for their opinion of the tests, direct hostile responses were rare. Three normals described the tests as "silly" or "stupid." One psychotic subject thought the tests were "very dead, dull"; another refused to continue with the tasks directing hostile remarks at the experimenter. A third psychotic patient initially expressed his approval, but apparently projected his criticism adding: "For someone who didn't understand, he would think they were foolish."

In general the replies to the question, "What did you think of the tests," were so varied in content that it was not possible to categorize the responses and to compare the groups with respect to them. For the most part the opinions seemed to be of a positive but somewhat evasive nature. Many subjects in both groups thought that the tests were "all right" or "interesting." Among the normals such statements were frequently qualified by stating that they really didn't know the purpose of the tests. Others tended merely to describe the tasks as "memory" or "intelligence tests," or commented on the difficulty without offering any opinions.

After encountering the large number of failures that these persons had, it appears highly improbable that the majority of the subjects in both groups truly could have felt that the tests were very good or interesting, or that (as one psychotic put it) "I enjoyed them very much."

Apparently the experimental situation was not conducive to the outward expression of hostile or aggressive feelings. The fact that the experimenter probably represented an authority figure to the patients may have contributed to the in-

hibition of such feelings. The effect of the presence of the experimenter on the inhibition of the expression of anger is demonstrated in an experiment by Dembo, which Koffka (6) has described.

In a situation where aggression is inappropriate Katz (5) points out that "masking, or camouflaging behavior (increased politeness, affected indifference, etc.) serve to conceal from the experimenter the vulnerability of the thwarted person: his emotional tension, ego injury (feelings of inferiority, shame, wounded pride, etc.), and punishable impulses (such as aggression)."

In the opinions of the tests expressed by both the schizophrenics and the normals, masking behavior seemed to predominate. However, most of the normals did not attempt to conceal emotional tension or ego injury when questioned about their feelings during failure and their estimates of their performance. On the other hand, despite their grossly inadequate performance after frustration, most of the schizophrenic patients attempted to conceal emotional disturbance.

The subjects who accepted unpleasant feelings appeared to be blaming themselves for their failures. Under conditions of failure due to lack of ability, Rosenzweig (11) states that inwardly directed aggression is warranted and can be considered an adequate reaction to frustration. The present experimental conditions were such that the subjects could

be expected to see themselves as instrumental in their failures. Thus, the more frequent reports of acceptance of self-blame among the normals indicate that in this respect, too, they reacted more adequately to frustration than the schizophrenics.

C. CUMULATIVE EFFECT OF FRUSTRATION

In order to determine the cumulative effect of frustration on the prefrustration scores of each of the four tasks and also on the drop scores, the raw scores in each task distribution were converted to *T* scores with a mean of fifty and a standard deviation of ten. Each subject's *T* scores then were arranged in a row according to the position in which the task was administered regardless of the nature of the task. An analysis of variance technique was employed to discover if any differences due to the position of the task existed in either the prefrustration scores or the drop scores of either group. The converted mean scores are presented in Table 4. Since the distributions of the two groups were treated independently, the differences between them are not reflected in the converted means.

For both groups the *between positions* variance ratios of the prefrustration scores and the drop scores were statistically insignificant. It was only in the prefrustration scores of the normal group that the variance ratio was above unity (1.10). Inspection of the converted mean

TABLE 4
CONVERTED MEAN SCORES (*T* SCORES) IN THE FOUR POSITIONS

	Group	1st Position	2nd Position	3rd Position	4th Position
Prefrustration Performance Scores	Normal	51.73	49.77	50.15	48.12
	Schizophrenic	50.27	50.06	50.31	49.65
Drop Scores	Normal	51.40	48.85	49.71	50.15
	Schizophrenic	50.15	48.25	51.02	50.77

scores, however, reveals the suggestion of a trend towards a decrease in the normal group's prefrustration performances as the number of tasks increased. Since a cumulative effect was anticipated, a direct comparison between the prefrustration scores in the first and final (fourth) positions is justified. In the normal group the *t* test for the difference between means in the first and fourth positions approaches significance at the .08 level of confidence. In the schizophrenic group the difference between the extreme positions of the prefrustration scores is well within chance limits; the four prefrustration scores remained fairly constant.

Although the results concerning the cumulative effect of successive frustrating experiences are not decisive, they do cast doubt upon the hypothesis that schizophrenics show progressive effects of frustration that are greater than those manifested by normals. As the number of separate tasks in which frustration was encountered increased, a depressing effect on the prefrustration performances of

the normals (but not on the prefrustration performances of the schizophrenics) was noted. This may reflect a reluctance on the part of some normals to engage wholeheartedly in tasks where failure seems inevitable, suggesting a decrease in their motivational level.

Jenkins (4) believes that schizophrenics have undergone a greater number of frustrations in real life than have normals, basing his reasoning on studies which have shown that schizophrenics as a group have had little success in school, many frustrations in family life, etc. It appears likely that as a result schizophrenics have developed defenses against frustration such as withdrawal or abandoning the task, fantasy to deny failure experiences, and perseverative behavior, which serve as tension-reducing devices. Hence, despite the grossly inadequate nature of such mechanisms in coping with the reality situation, they may protect the individual to some extent from the emotionally disruptive effects of frustrating experiences.

III. SUMMARY AND CONCLUSIONS

The purpose of this experiment was to measure and to compare the effects of frustration on the performance of schizophrenic and normal individuals. Two groups, 48 schizophrenic patients and 48 normals, were matched approximately for age, intelligence, and education. The individuals in both groups were subjected to frustration in four tasks (auditory memory, visual memory, auditory perception, and visual perception). Frustration was said to exist when the subject had demonstrated a need to attain success in a task, and success in certain subsequent items of the task was thwarted by virtue of the increasing difficulty of the objective situation.

Each task consisted of two equivalent forms; items within each form were graded in difficulty. When failure occurred, it was pointed out without critical comment. Measures of the subject's performance on the form administered prior to failure and on the equivalent, alternate form following failure were obtained. The difference between the two scores so obtained was employed as the measure of the adequacy of the individual's response to frustration.

Since attention and concentration difficulties are characteristics of schizophrenic behavior, it was necessary to determine if merely the length of the tasks would cause a decrement in the performance of

the schizophrenics. A preliminary group of 24 schizophrenic subjects was subjected to the same tasks under conditions of minimal frustration. The number of successive failures was reduced and the subjects were not informed of errors. The results indicated that no change occurred in performance from the first to the second form of each task, and that no cumulative positional effects were evident. Thus, the results are consistent with the assumption that any changes in performance in the experimental groups may be attributed to the introduction of the experimental variable.

In the two memory tasks the mild stress situation was sufficient to reduce to some extent the scores of the normals, and, to a significantly greater degree, also those of the schizophrenics. In the perceptual tasks the normals were able to maintain their level of performance despite the intervening failures; the schizophrenics were not. Thus, the consistently poorer performance of the schizophrenic group following frustration as compared with the performance of the normal group supports the hypothesis that schizophrenics have a lower frustration tolerance than normals.

The schizophrenics also differed qualitatively from the normals in their reactions to frustration. After encountering frustration the schizophrenics manifested a greater tendency to abandon the tasks by refusing to respond and by spending less time with items. Although during the most difficult section of the Auditory Perception task the psychotic group made many more guesses than the normals, these guesses were to a large extent of a perseverative nature rather than genuinely fresh attempts at solution. After frustration, when the task was again solvable as judged by the subject's performance prior to failure, significantly more

schizophrenics than normals made perseverative guesses.

Within the normal group those individuals who preferred to make an attempt to respond, even though incorrectly, rather than omit after having encountered frustration, tended to perform more adequately than those normals who made more omissions than guesses. For the schizophrenics, however, it made little difference whether they refused to offer responses or guessed, since many of their guesses were perseverative attempts. In respect to the greater number of guesses, including many inadequate attempts, the reaction of the schizophrenics to relatively mild stress resembles somewhat the behavior of severely frustrated normals.

Some forms of bizarre behavior (such as hallucinations and fantasy) occurred as a consequence of frustration in a small number of schizophrenic patients. Other forms of bizarre behavior (such as the use of nonsense words) appeared to be habitual means of dealing with the environment.

The normals were more ready to admit poor performance and the presence of unpleasant feelings (shame, depression, self-blame, etc.) accompanying failure than were the schizophrenics. Under conditions of failure due to lack of ability, self-criticism is probably a more adequate reaction to frustration than attempts to conceal emotional disturbance.

The experimental situation was not conducive to the overt expression of aggression. Hostile remarks were rare in both groups. Despite the large number of failures encountered, most subjects in both groups made polite comments of approval when asked for their opinions of the experimental tests.

As the number of tasks in which frustration was encountered increased, the

normals manifested a trend in the direction of a progressive decrease in their prefrustration performances in the four tasks. The suggested cumulative effect of successive frustrations may reflect a lowered motivational level. Although the schizophrenics were less able to cope adequately with frustration within each

task, their prefrustration scores in the four tasks remained fairly constant throughout. The inadequate reactions of the schizophrenics to frustration (such as withdrawal and perseveration) may serve as tension-reducing mechanisms so that continuing effects of frustration were not apparent.

BIBLIOGRAPHY

1. BENTON, A. L. A visual retention test for clinical use. *Arch. Neurol. Psychiat.*, 1945, 54, 212-216.
2. BROWN, J. F. Reactions of psychiatric patients in a frustrating situation. *Bull. Menninger Clin.*, 1939, 3, 44-64.
3. DOLLARD, J., DOOB, L. W., MILLER, N. E., MOWRER, O. H., & SEARS, R. R. *Frustration and aggression*. New Haven: Yale Univer. Press, 1939.
4. JENKINS, R. L. Nature of the schizophrenic process: A working hypothesis for therapy. *Arch. Neurol. Psychiat.*, 1950, 64, 243-262.
5. KATZ, I. Emotional expression in failure: A new hypothesis. *J. abnorm. soc. Psychol.*, 1950, 45, 329-349.
6. KOFFKA, K. *Principles of gestalt psychology*. New York: Harcourt, Brace, 1935.
7. MAIER, N. R. F. *Frustration: The study of behavior without a goal*. New York: McGraw-Hill, 1949.
8. PATRICK, J. R. Studies in rational behavior and emotional excitement. II. The effect of emotional excitement on rational behavior in human subjects. *J. comp. Psychol.*, 1934, 18, 1-22.
9. POSTMAN, L., & BRUNER, J. S. Perception under stress. *Psychol. Rev.*, 1948, 55, 314-323.
10. RICKERS-OVSIANKINA, M. Studies in the personality structure of schizophrenic individuals: II. Reaction to interrupted tasks. *J. gen. Psychol.*, 1937, 16, 179-196.
11. ROSENZWEIG, S. Frustration as an experimental problem. VI. A general outline of frustration. *Charact. & Pers.*, 1938, 7, 151-160.
12. SHAKOW, D. The nature of deterioration in schizophrenic conditions. *Nerv. ment. Dis. Monogr. Ser.*, 1946, No. 70.
13. SYMONDS, P. M. *The dynamics of human adjustment*. New York: Appleton-Century, 1946.
14. THORNDIKE, E. L., & LORGE, I. *The teacher's wordbook of 30,000 words*. New York: Columbia Univer., 1944.
15. WILENSKY, H. *The performance of schizophrenic and normal individuals following frustration*. Unpublished doctoral dissertation, New York University, 1951.
16. *Manual of instructions for auditory test No. 14*. National Defense Research Committee, Cambridge: Harvard Univer., March, 1945.

(Accepted for publication, February 6, 1952)